ADVANCED SECURITY CONTAINER DEVELOPMENT

Work Specifications

A. General

1. Improved safes and vaults (security containers) are needed which will provide efficient protection against modern threats such as gamma radiation gaging, micro-miniature boroscope techniques, chemical attacks, pyro-technic attacks, etc. Additionally, such container designs must enable balanced security performance against all realistic threats for a wide range of protection levels including situations where supplemental security measures are available as well as where safes and vaults must provide stand-alone protection.

2. The performance testing phase of a security container study project recently completed by Sandia Labs has shown that the designs of currently used safes and vaults are grossly inefficient when considering modern threats. Excessive weight and cost are wasted in attempts to counter some obsolete tool threats while other threats are neglected. Therefore, the advanced designs anticipated from this program are expected to result in economies as well as in improved security performance.

3. The goal of this program is the evaluation of advanced materials for use in the design of advanced safes and vaults which will provide balanced protection against modern threats. The program goal shall be accomplished through studies of potentially suitable materials and combinations of material followed by an evaluation effort.

4. Approximately two man-years of effort are considered appropriate for completion of this program.

5. The duration of this program should not exceed one year.

B. Tasks

The following three general tasks, with approximate levels of effort as indicated, are considered necessary for accomplishment of the project goal. A separate detailed report shall be prepared for each of the three tasks.

1. Basic Materials: Potentially suitable new and composite materials for thwarting all realistic threats will be investigated, analyzed, and tested to the extent necessary to accomplish the project goal. The most promising materials shall be selected for subsequent use based on the material's past performance, testing using all practical attack modes identified during the Sandia Labs Security Container Study, cost, and ease of fabrication. (35%)

2. Composite Barriers: Composite barriers shall be fabricated to provide balanced levels of protection using the most promising basic materials identified in Task 1. Barriers will constitute complete sections through which attacks must pass and can simulate walls, doors, drawer fronts, etc. Each barrier will be evaluated based on test results from considering all realistic attacks as determined during the Sandia Labs Security Container Study. (40%)

3. System Evaluation The suitability of identified materials will be evaluated in terms of four potential applications: safe applications, vault door applications, vault wall/interior configuration applications, and field-portable vault applications. The evaluation will be performed by considering how the various materials could be utilized in designs to meet the below listed technical goals. The evaluation will further consider the steps and cost actually required to fabricate candidate items to identify any peculiar problems that may exist with otherwise desirable materials. (25%)

a. Safe Application. Performance goals are as shown below.

Safe Design Goals

	minimum-security safe	high-security safe
Stand-off time	$\sim$ 3 minutes	$\geq$ 30 minutes
Weight	$\leq$ 300 pounds	$\leq$ 1,200 pounds
Storage Volume	$\geq$ 9 cubic feet	$\geq$ 8 cubic feet
Cost	$\leq$ $500	$\leq$ $3,000

b. Vault Door Application. Performance goals are as shown below.

Vault Door Design Goals

	minimum-security vault	high-security vault
Stand-off time	∿ 3 minutes	> 30 minutes
Weight	< 300 pounds	≤ 2,400 pounds
Cost	≤ $400	≤ $3,000

c. Vault Wall/Interior Configuration Applications. Several vault walls and interior configurations shall be considered for security level compatibility with the vault doors designed in Task 3(b). Such wall and interior configuration designs will be based on the results of Tasks 1 and 2 and data from related programs as well as the use of commonly available materials in order to evaluate several options for a vault designer to handle a variety of field situations. Performance goals are as shown below.

Vault Walls/Ceiling/Floor Design Goals

	minimum-security vault	high-security vault
Stand-off time	∿ 3 minutes	> 30 minutes
Weight	< 50 pounds/sq.ft.	≤ 175 pounds/sq. ft.
Cost	≤ $15/sqare foot	≤ $50/sqare foot

d. Field-Portable Vault Application. One field-portable vault shall be considered based on the results of Tasks 1 and 2. The vault must be capable of being rapidly assembled and disassembled in the field using only tools, materials, and parts easily shipped via air freight. The

level of security provided by the vault will be the highest practical level but will be governed by weight and portability constraints.

Portable Vault Design Goals

	Door	Walls
Weight	150 pounds	10 pounds/square foot
Cost	$\leq$ \$700	$\leq$ \$50/square foot

C. Program Review

A program review will be conducted at the end of Task 1 and again at the end of Task 2 so that the impact of progress in the materials evaluation phases on subsequent phases may be assessed and any program redirection required accomplished.